



Gate 100 in 1964.

Nevada National Security Site Overview

Introduction

The Nevada National Security Site (NNSS) provides a unique and indispensable extension of the national laboratories' experimental capabilities in support of the Stockpile Stewardship Program. In addition to ongoing environmental cleanup of historic nuclear research and testing areas on the NNSS, defense, national security, and non-defense research and development activities are conducted in cooperation with universities, industries, and other federal agencies as part of NNSS's Strategic Partnership Project activities.

In the Beginning

After the first nuclear test at the Trinity Site in New Mexico, the United States moved its nuclear weapons experimentation program to the Pacific. Security and logistical issues quickly illustrated the need for a continental test site. After consideration of many possible sites, an Atomic Energy Commission meeting on Dec. 12, 1950, concluded that the Las Vegas Bombing and Gunnery Range in Nevada satisfied nearly all of the established criteria for a continental proving ground. As a result, President Harry Truman authorized a 680-square mile section of the Nellis Air Force Gunnery and Bombing Range in Southern Nevada (65 miles northwest of Las Vegas) as the Nevada Proving Grounds on Dec. 18, 1950, which subsequently became the Nevada Test Site. In 2010, the name was changed to the Nevada National Security Site.

Atmospheric and Underground Testing

On Jan. 27, 1951, the first atmospheric nuclear test was detonated at the NNSS, code-named Able. A total of 100 atmospheric tests were conducted at the NNSS until July 1962. All atmospheric testing was banned on Aug. 5, 1963, when the Limited Test Ban treaty was signed in Moscow; this gave birth to the age of underground testing. The United States conducted 828 underground tests at the NNSS. The last underground test, Divider, was conducted on Sept. 23, 1992.

The end of nuclear testing and the start of subcritical experiments

After conducting 928 nuclear tests, fullscale nuclear testing came to an end in 1992 when the United States voluntarily joined with Russia, the United Kingdom and France in a test moratorium. President Clinton signed the Comprehensive Test Ban Treaty (CTBT) in 1996; however, the treaty was never ratified by the U.S. Senate. Despite not being ratified, the U.S. has continued to observe the CTBT protocols and test moratorium to the present day. In order for the U.S. to maintain the safety and reliability of its nuclear stockpile without conducting full-scale tests, subcritical experiments were initiated at the NNSS. An experiment is considered subcritical if no critical mass is formed and no self-sustaining nuclear reaction occurs. Subcritical experiments occur more than 900 feet below ground at the U1a Complex.

Stockpile Stewardship

By careful measurement of the materials composing a nuclear weapon and

studying how those materials interact and age, scientists can predict changes in safety, reliability and performance of the nation's nuclear stockpile in the absence of nuclear testing.

Scientists replicate the extreme temperatures and pressures of a nuclear reaction to measure important dynamic material properties of plutonium and other materials. Results from these experiments are combined with computer simulations to detect and predict the unique changes that occur in the aging stockpile.

The Joint Actinide Shock Physics Experimental Research (JASPER)

Facility gas gun plays an integral role in material property studies for the Stockpile Stewardship Program. JASPER provides a method to generate data pertaining to the properties of plutonium at high shock pressures, temperatures and strain rates. Experiment results are used in nuclear weapons code refinement and to enhance the program's predictive capability.

The Device Assembly Facility (DAF)

was constructed in the 1980s to support underground nuclear testing. DAF was designed and built to consolidate all nuclear explosive assembly functions, to provide safe structures for high explosive and nuclear explosive assembly operations, and to provide a state-of-the-art safeguards and security environment. Now that the United States is under a continuing nuclear testing moratorium, the DAF provides support for Stockpile Stewardship subcritical experiments to Lawrence Livermore National Laboratory (LLNL), Los Alamos National Laboratory (LANL) as well as the Department of Defense, Department of Homeland Security, and other entities.

The U1a Complex is an underground laboratory used for subcritical experiments, physics experiments that are used to obtain technical information



about the U.S. nuclear weapons stockpile. These experiments are conducted in tunnels constructed 963 feet below the surface. The experiments help support the Stockpile Stewardship Program, created to maintain the safety and reliability of the U.S. nuclear weapons stockpile.

The Big Explosives Experimental

Facility (BEEF) provides data, through conventional or high-explosive experiments, to support the Stockpile Stewardship Program, along with a variety of new experimental programs that expand the nation's non-nuclear experiment capabilities. Scientists also conduct weapons physics experiments, using high explosives to study and investigate impacted materials as they are merged together by the explosions.

Global Security

Global Security personnel are the nation's experts in detecting and locating "dirty bombs," "loose nukes," and other radiological sources. Global Security characterizes the threat environment, produces specialized radiological/nuclear detection equipment, trains personnel on the equipment and its operations, tests and evaluates the equipment, and develops high-tech equipment to defeat terrorists.

The Nonproliferation Test and Evaluation Complex (NPTEC) is the only facility of its kind for either large- or small-scale hazardous and toxic materials testing under controlled conditions. It is ideally suited for verifying effects of toxic and hazardous materials on the environment.

The Radiological/Nuclear Countermeasures Test and Evaluation Complex (RNCTEC) is a multi-use test and evaluation platform that serves the U.S. homeland security mission. The Department of Homeland Security's Domestic Nuclear Detection Office established RNCTEC to support all federal agencies to develop, acquire

and support the deployment of domestic nuclear detection systems.

The Counterterrorism Operations Support Program provides valuable hands-on training to emergency personnel who respond to terrorist acts involving chemical, biological, radiological, and high-explosive weapons. Members from local, state and federal agencies interact with emergency personnel to establish standard operating procedures and develop decontamination procedures.

Environmental Management

Radioactive Waste Management Sites have been operating since 1961 for the disposal of low-level and mixed low-level radioactive waste from U.S. Department of Energy and Department of Defense generators. The waste is generated by the environmental cleanup of the country's nuclear weapons complex. The waste includes materials such as soil, construction debris and used laboratory equipment.

The Environmental Restoration Project is responsible for corrective actions at sites on the NNSS and the U.S. Air Force's Nevada Test and Training Range, to include the Tonopah Test Range. Contaminants at these sites include radioactive materials, oils, solvents, gasoline, heavy metals and unexploded ordnance.

Environmental protection, compliance and monitoring of the air, water, plants, animals and cultural resources is also conducted at the NNSS.

In addition to its contribution to the nation's defense, the NNSS also partners with a number of educational institutions to provide an outdoor laboratory for research and experiments related to the Site's unique environment.

Additional information on the NNSS can be found at:

<https://www.nnss.gov>

<https://www.nnss.gov/pages/resources/library/FactSheets.html>

<https://www.labpartnering.org/labs/nnss>



For more information, contact:
U.S. Department of Energy
National Nuclear Security Administration
Nevada Field Office
Office of Public Affairs

P.O. Box 98518
Las Vegas, NV 89193-8518

Phone: 702.295.3521
Fax: 702.295.0154
Email: nevada@nnsa.doe.gov

www.nnss.gov

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